Having described the invention, we claim:

1. A seal for sealing between first and second fluid flow components when the components are joined to each other, the first component having a first counterbore in a first surface and the second component having a second counterbore in a second surface, when the components are joined to each other the first surface overlying the second surface and the first counterbore overlying the second counterbore, the seal comprising:

a seal structure for engagement with the first and second fluid components in the first and second counterbores; and

a holding plate structure for engagement with the first and second surfaces of the first and second fluid components;

the holding plate structure including one or more layers that are formed with the first and second outer layers of the seal structure.

2. A seal as set forth in claim 1 wherein the seal includes a single piece of metal that forms the holding plate structure and the first outer layer and the second outer layer of the seal structure.

3. A seal as set forth in claim 1 wherein the holding plate structure includes first and second pieces of metal secured together, the first piece of metal forming the first layer of the holding plate structure and the first outer layer of the seal structure, the second piece of metal forming the second layer of the holding plate structure and the second outer layer of the seal structure.

4. A seal as set forth in claim 3 wherein the inner layer of the seal structure is a ring-shaped piece of metal that is formed separately from the holding plate structure and that is captured between the first and second outer layers of the seal structure.

5. A seal as set forth in claim 3 wherein the first and second pieces of metal are substantially identical to each other and are arranged in an overlying back to back relationship.

6. A seal as set forth in claim 5 wherein each one of the first and second pieces of metal is a sheet metal stamping.

7. A seal as set forth in claim 1 wherein the holding plate structure is generally planar and wherein the first and second outer layers of the seal structure project out of the plane of the holding plate structure

8. A seal as set forth in claim 1 wherein the first and second outer layers of the seal structure are circular in configuration and define fluid flow openings that align with fluid flow openings in the first and second components when the first and second components are joined to each other.

9. A seal as set forth in claim 1 that is adapted to seal between first and second components that have edges defining the first and second counterbores, respectively, the holding plate structure having a raised land area adjacent the seal structure that is engageable by one of the component edges and that is indented to resist shear slip of the seal between the first and second components.

10. A seal as set forth in claim 3 having at least two fluid openings and having slits located at predetermined positions between the fluid openings to facilitate material movement.

11. A seal as set forth in claim 1 that is made from stainless steel.

12. A seal for sealing between first and second fluid flow components when the components are joined to each other, the first component having a first counterbore in a first surface and the second component having a second counterbore in a second surface, when the components are joined to each other the first surface overlying the second surface and the first counterbore overlying the second counterbore, the seal comprising:

a seal structure for engagement with the first and second fluid components in the first and second counterbores; and

a holding plate structure connected with the seal structure for engagement with the first and second surfaces of the first and second fluid components;

the seal structure comprising at least three abutting layers of metal including first and second outer layers for engagement with the first and second fluid components and an inner layer, the first and second outer layers having a hardness that is selected to be less than the hardness of the counterbores of the first and second components, the inner layer having a hardness that is selected to be greater than the hardness of the first and second outer layers;

the inner layer of the seal structure transmitting force between the outer layers when the components are joined together with the seal structure in the counterbores.

13. A seal as set forth in claim 12 wherein the first and second outer layers of the seal structure are formed with the holding plate structure.

14. A seal as set forth in claim 13 wherein the holding plate structure is formed from only one piece of metal that includes also the first and second outer layers of the seal structure.

15. A seal as set forth in claim 13 wherein the holding plate structure is formed from first and second layers of metal joined together, the first outer layer of the seal structure is formed with the first layer of metal, and the second outer layer of the seal structure is formed with the second layer of metal.

16. A seal as set forth in claim 12 wherein the inner layer is a seal ring that is formed separately from the holding plate structure and that is captured by the first and second outer layers of the seal structure, the outer layers being clamped by the first and second counterbores against the seal ring when the components are joined together with the seal structure in the counterbores.

17. A seal as set forth in claim 12 wherein the holding plate structure is made from a generally planar metal structure that also has non-planar portions that form the first and second outer layers of the seal structure.

18. A method of achieving a metal to metal seal between two relatively hard metal components in a fluid system, comprising the steps of:

providing a metal seal that includes a seal structure and a holding plate structure, the seal structure including two relatively soft seal elements and one relatively hard seal ring captured between the seal elements;

placing the seal between the two fluid system components so that the two seal elements sealingly engage counterbores of the fluid system components with the seal ring between them thereby providing a stack of metal members that are arranged in a hard, soft, hard, soft, hard order and

transmitting force through the stack of metal members to maintain a seal between the fluid components without contact between the fluid components and the relatively hard seal ring.

19. A method as set forth in claim 18 wherein the step of transmitting force through the stack of metal members includes:

indenting a raised land portion of the seal with one or more edges of the counterbores of the first and second components thereby to resist shear slip of the seal between the first and second components.

20. A method as set forth in claim 18 wherein

the step of providing a metal seal includes providing a metal seal in which the seal elements are formed with the holding plate structure; and

the step of placing the seal between the two fluid system components includes supporting the seal structure with the holding plate structure during assembly of the seal between the two fluid system components.

21. A seal for sealing between first and second fluid flow components when the components are joined to each other, the first component having a first planar surface and the second component having a second planar surface, when the

components are joined to each other the first planar surface overlying the second planar surface, the seal comprising:

a seal structure for engagement with the first and second planar surfaces of the first and second fluid components; and

a holding plate structure for engagement between the first and second fluid components;

the holding plate structure including one or more layers that are formed with the first and second outer layers of the seal structure.

22. A seal as set forth in claim 21 wherein the first planar surface is a counterbore in the first component and the second planar surface is a counterbore in the second component.

23. A fluid system including:

a substrate;

a plurality of fluid components mounted on the substrate;

a fitting associated with the substrate for directing fluid to flow between the components; and

a plurality of seals for sealing between the components and the substrate;

each one of the seals including a seal structure comprising three layers of metal with a relatively soft inner layer and two relatively hard outer layers, each seal also including a holding plate structure for engagement between the substrate and one of the components, the holding plate structure being formed with the seal structure.

24. A system as set forth in claim 23 wherein the components are fluid components such as regulators, valves, flow meters, mass flow controllers, and check valves.

25. A seal comprising:

a seal structure; and

a holding plate structure;

the seal structure comprising three layers of metal with a relatively soft inner layer and two relatively hard outer layers;

the holding plate structure being formed with the seal structure.

26. A seal as set forth in claim 25 wherein the holding plate structure includes one or more layers of metal that are formed with the outer layers of the seal structure.

27. A seal as set forth in claim 26 wherein the seal includes two metal stampings, each of which includes one layer of metal in the holding plate structure and one of the two outer layers of the seal structure.